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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,060	02/26/2002	Kyle Spring	IR-1821 (2-2833)	4378

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NEW YORK, NY 100368403

EXAMINER

RAO, SHRINIVAS H

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,060

Applicant(s)

SPRING ET AL.

Examiner

Steven H. Rao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3 to 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 3 to 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicants' amendment filed on July, 07, 2003 has been entered on July 11, 2003. Therefore claim 3 as originally filed and claims 4 to 10 as recited in the amendment of January 28, 2003 are currently pending in the Application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 3 to 10 are rejected under 35 U.S.C. 102 (b) as being anticipated by Hshieh et al. (U.S. Patent No. 5,907,776, herein after Hshieh). (The previous rejection is reproduced below for ready reference and for the answer to Applicants' instant arguments –see Response to Arguments section below).

With respect to claim 3 , Hshieh describes a method for producing a vertical MOSFET, the method comprising :

Applying a blanket implant of a first conductivity type to a substrate of a second conductivity type (Hshieh fig. 3 , col. 4 lines 40-45. Hshieh col. 4 lines 50-51 body layer ,of N-type material in P-MOSFET), forming a gate on the substrate (Hshieh fig. 3 # 38,42) , diffusing a channel region in the substrate proximate to the gate (Hshieh fig. 3 # 50), implanting a source region of the second conductivity type into the channel region (

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Hshieh fig. 3 # 48, source P type), whereby the channel region includes a depletion implant area proximate to the gate, the depletion implant area being of the first conductivity type and having a concentration of carriers of the first conductivity type which is greater than the concentration of carriers in the first of the channel region. (Hsieh col. 4 lines 54-67).

With respect to claim 4 Hshieh describes a method for producing a vertical MOSFET, the method comprising: selecting an active region in a major surface of a semiconductor body of a first conductivity type (Hshieh fig. 3 , col. 4 lines 40-45) ; implanting dopants of a second conductivity type in all of said active region (Hshieh col. 4 lines 50-51 body layer of N-type material in P-MOSFET); forming a plurality of spaced channel region of said second conductivity type in said active region (Hshieh fig. 3 # 50) ; and forming at least one source region of said second conductivity type in each of said channel regions. (Hshieh fig. 3 # 48, source P type)

With respect to claim 5 Hshieh describes the method of claim 4 further comprising, forming gate structures adjacent each channel region,(Hshieh fig. 3 # 38,42 col. 4 line 66) each gate structure comprising a gate oxide formed over said active region and a respective gate electrode disposed over said gate oxide. (Hsieh fig.3 # 44, col. 4 line 49).

With respect to claim 6 Hshieh describes the method of forming a field oxide layer over said major surface of said semiconductor body and opening a window to expose said active region. (Hshieh fig. 7 c , col. 6 lines 20-24).

With respect to claim 7 Hshieh describes the method wherein said dopants of

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said second conductivity type are implanted through said window in said field oxide layer.(Hshieh figs. 7 F, I, J)

With respect to claim 8, Hshieh describes the method of claim 4, wherein said dopants of said second conductivity type are comprised of boron. (Hshieh fig. 7 J)

With respect to claim 9, Hshieh describes the method, wherein said dopants of said second conductivity type are comprised of one of arsenic and phosphorous. (Hshieh , col. 7 line 15).

With respect to claim 10, Hshieh describes the method further comprising, forming depositing and oxide interlayer over said active region; opening windows over at least said source regions; and forming a source contact over said active region.

Response to Arguments

Applicant's arguments filed July 11, 2003 have been fully considered but they are not persuasive because Applicants' first contention that the applied Hshieh reference does not describe as previously stated Figure 3 and col. 4 lines 4045, 50-51 of Hshieh clearly show blanket implantation.

Further proof that Hshieh shows blanket implantation at least in figures 7 I and J and col. 7 lines 34-38 (reproduced below) which steps occur prior to forming other features of the device (see features formed in figures 7 L to 7 N) (are :

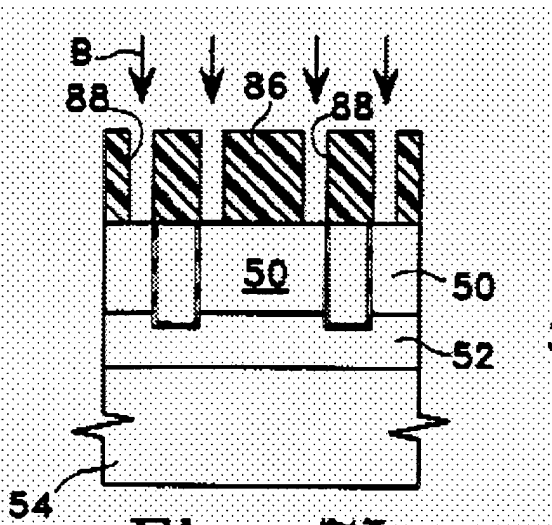


Fig. 7I

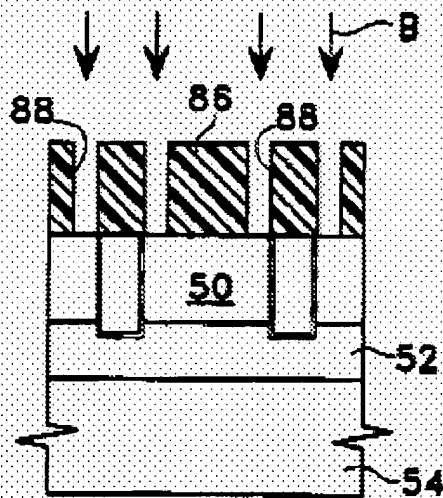


Fig. 7J

formed on the top of the structure. Boron is then ion-implanted into the masked structure with an implant dosage of approximately $5 \times 10^{15} \text{ cm}^{-2}$ to $1 \times 10^{16} \text{ cm}^{-2}$ under an implant potential of between 40 KeV to 100 KeV, as shown in FIG. 7I.

Applicants' second contention that with respect to claim 4 that Hisheh does not teach the recited step of "selecting an active region in a major surface of a semiconductor body of a first conductivity type; implanting dopants of a second

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conductivity type in all of said active region" is not persuasive because (as previously stated) Hsieh in figure 3, col. 4 lines 40-45 and col. 4 lines 50-51 and figures 7 I to 7N and col. 7 lines 34-38 shows the recited steps.

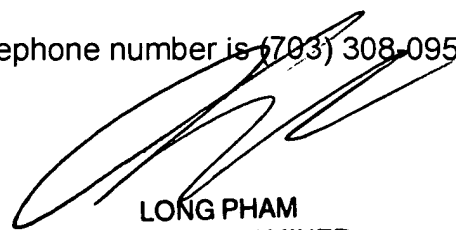
Therefore Hshieh anticipates claims 3 to 10.

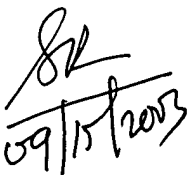
THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5945. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.


LONG PHAM
PRIMARY EXAMINER


09/15/2013